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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------------------------------------------------------------------|-------------|----------------------|------------------------------|------------------------|
| 10/824,427 | 04/15/2004 | Toshihiro Kuriyama | 69804-016 | 6500 |
| 7590 McDermott, Will & Emery 600 13th Street, N.W. Washington, DC 20005-3096 | | | EXAMINER CHEN, CHIA WEI A | |
| | | | ART UNIT 2622 | PAPER NUMBER |
| | | | MAIL DATE 05/13/2008 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/824,427

Applicant(s)

KURIYAMA, TOSHIHIRO

Examiner

CHIA-WEI A. CHEN

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
4a) Of the above claim(s) 8-13 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-7 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-85/86)
Paper No(s)/Mail Date 04/15/04
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Inventor's Patent Application
6) ☐ Other: _____

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abramovich (US 6,221,687) in view of Shimada (US 4,689,652).

Claim 1, Abramovich teaches a solid-state imaging device in which a pixel-by-pixel array of photoelectric conversion sections (photodiode 214) each generate an electrical charge in accordance with an amount of light entering the photoelectric conversion section, and the electrical charges generated by the photoelectric conversion sections are converted to an electrical signal to be output (col. 4, lines 8-43), comprising:

- a color filter layer (255) disposed above the photoelectric conversion sections, the color filter layer allowing light of a specific wavelength to pass therethrough;
- upper lenses (550) disposed above the color filter layer, the upper lenses causing incident light to be converged so as to enter the color filter layer; and

- intralayer lenses (microlens 245) disposed between the color filter layer and the photoelectric conversion sections, each intralayer lens causing the light converged by each upper lens to be further converged so as to enter a corresponding one of the photoelectric conversion sections (Fig. 5);

but does not teach:

- wherein each intralayer lens has a Fresnel lens structure.

Shimada teaches wherein the intralayer lens has a Fresnel lens structure (Figs. 7-10; col. 7, lines 8-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the Fresnel lens structure of Shimada with the imaging device of Abramovich in order to shorten the overall length of the optical path may be shortened. (See col. 2, lines 45-49 of Shimada.)

Claim 2, Shimada teaches wherein each intralayer lens includes:

- a center lens having a circular and curved surface whose center is on an optical axis of the center lens (col. 7, lines 18-29); and
- at least one annular lens disposed on the outside of the center lens, the at least one annular lens having a annular and belt-like face which is concentric to the center lens with respect to the optical axis (col. 7, lines 18-29; Fig. 8).

Claim 7, Abramovich teaches wherein each intralayer lens comprises SiN (silicon nitride) (col. 5, lines 35-40; Fig. 4a).

4. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abramovich (US 6,221,687) in view of Shimada (US 4,689,652) as applied to claim 2 above, and further in view of Feingold (US 6,599,305).

Claim 3, Abramovich in view of Shimada teaches the solid-state imaging device according to claim 2, but does not expressly teach wherein a refractive index of the center lens and a refractive index of the at least one annular lens are not equal.

Feingold teaches wherein a refractive index of the center lens and a refractive index of the at least one annular lens are not equal (col. 13, lines 15-36).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the variations in refractive index across the lens in order to establish a multifocal lens. (See col. 12, lines 44-45 of Feingold.)

Claim 4, Feingold does not explicitly teach wherein a refractive index of the center lens and a refractive index of the at least one annular lens increase toward outside and away from the optical axis of the center lens.

However, it would have been obvious to a person having ordinary skill in the art to have varied the refractive index as disclosed in claim 4 to establish different focusing properties of the lens.

Claim 5, Feingold teaches wherein a refractive index of the center lens and a refractive index of the at least one annular lens decrease toward outside and away from the optical axis of the center lens (col. 13, lines 15-36).

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abramovich (US 6,221,687) in view of Shimada (US 4,689,652) as applied to claim 2 above, and further in view of Howard (US 4,643,752).

Claim 6, Abramovich in view of Shimada teaches the solid-state imaging device according to claim 2, but does not expressly teach wherein a width of the at least one annular lens along a radius direction thereof decreases toward outside and away from the optical axis of the center lens.

Howard teaches wherein a width of the at least one annular lens along a radius direction thereof decreases toward outside and away from the optical axis of the center lens (col. 2, lines 33-35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the decreasing width of the Fresnel zones of Howard with the imaging device of Abramovich in view of Shimada to increase the spatial resolution of a Fresnel lens. (See col. 1, lines 43-46 of Howard.)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIA-WEI A. CHEN whose telephone number is

(571)270-1707. The examiner can normally be reached on Monday - Friday, 7:30 - 17:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chia-Wei A Chen/
Examiner, Art Unit 2622
05/09/2008

***/Ngoc-Yen T. VU/
Supervisory Patent Examiner, Art Unit 2622***